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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Terrance J. Dishongh et al.

Title: APPARATUS FOR SHIELDING TRANSMISSION LINE EFFECTS ON A PRINTED CIRCUIT BOARD

Docket No.: 884.357US1

Filed: December 7, 2000

Examiner: Tuan Dinh

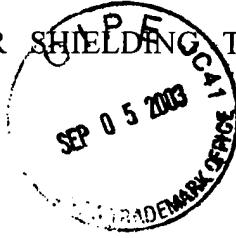
Customer No.: 21186

Serial No.: 09/732115

Due Date: September 2, 2003

Group Art Unit: 2827

Confirmation No.: 1363



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Alexandria, VA 22313-1450

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- ☒ A return postcard.
- ☒ Appellants' Brief on Appeal, including Appendix (in triplicate) (11 pgs.).
- ☒ Charge Deposit Account No. 19-0743 in the amount of \$320.00 to cover the fee for submission of an Appeal Brief.

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SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

Customer Number 21186

By:
Atty: John M. Dahl
Reg. No. 44,639

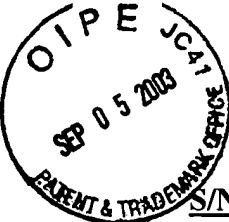
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SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
(GENERAL)

Customer Number 21186



EXPEDITED PROCEDURE – EXAMINING GROUP 2827

S/N 09/732115

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Terrance J. Dishongh et al. Examiner: Tuan Dinh
Serial No.: 09/732115 Group Art Unit: 2827
Filed: December 7, 2000 Docket No.: 884.357US1
Title: APPARATUS FOR SHIELDING TRANSMISSION LINE EFFECTS ON A PRINTED
CIRCUIT BOARD

**APPEAL BRIEF TO THE BOARD OF
PATENT APPEALS AND INTERFERENCES OF THE
UNITED STATES PATENT AND TRADEMARK OFFICE**

Mail Stop Appeal Brief - Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellant's Brief on Appeal

This brief is presented in Appeal from the final rejection of claims 1-8 of the above identified application. The Final Office Action from which the Appellant hereby appeals was mailed on July 2, 2003.

The appeal brief is filed in triplicate. Please charge the requisite fee set forth in 37 C.F.R. § 1.17(f) to Deposit Account 19-0743. Appellant respectfully requests reversal of the Examiner's rejection of pending claims 1-8. Appellant reserves the right to request an Oral Hearing at a later date.

1. Real Party in Interest

The real party in interest of the above-captioned patent application is the assignee, Intel Corporation, a corporation organized and existing under and by virtue of the laws of the State of Delaware, and having an office and place of business at 2111 Northeast 25th Avenue, Hillsboro, Oregon, 97124.

2. Related Appeals and Interferences

There are no other appeals or interferences known to the Appellant which will have a bearing on the Board's decision in the present appeal.

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3. Status of the Claims

Claims 1-8 are pending in the present application, and stand under Final Rejection. Claims 1-23 were rejected under 35 USC § 102(b) as being anticipated by Shacklette et al. (U.S. 5,850,498).

4. Status of Amendments

Claims 1 was amended in prosecution to more specifically recite that the conductive member of the printed circuit board was electrically conductive, and to correct the objected-to reference regarding "its length". Claims 2 and 5 were amended to reflect that the limitations recited in those dependent claims referenced base claim 1, and further comprised the recited limitations. Claims 9-29 were withdrawn from consideration during prosecution. No amendments are pending.

5. Summary of the Invention

In one example embodiment of the invention, a printed circuit board (PCB) comprises a dielectric board member and a first signal line supported on said dielectric board member. The first signal line includes an elongated electrically conductive member that is enshrouded with a carbon-based cladding over at least a portion of the elongated conductive member.

6. Issue Presented for Review

Whether Claims 1-23 are unpatentable under 35 USC § 102(b) in view of Shacklette et. al. (U.S. Patent No. 5,850,498).

7. Grouping of Claims

Although each claim recites its own limitations and is distinct from the other pending claims, each of the claims presented here for review other than Claim 1 depends from Claim 1. Claims 1-8 are therefore appropriately reviewed together for purposes of this appeal, and are believed patentable based on the arguments presented here relative to pending Claim 1.

8. Argument

1) The Applicable Law

To sustain a rejection under 35 U.S.C. §102(b), disclosure of each element of the claims under consideration must be shown in a single prior art reference. *In re Dillon* 919 F.2d 688, 16 USPQ2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991). “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP § 2131. Further, the elements must be arranged as recited in the claims under consideration. “Anticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*” *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added).

2) Discussion of the Rejections

I) The rejection of Claims 1-8 under 35 U.S.C. §102(b) as being unpatentable over Shacklette et. al. (U.S. Patent No. 5,850,498).

Shacklette describes an optical waveguide having a waveguide core and a cladding, both the core and cladding being made of a photopolymerizable acrylate compound, such as a multifunctional acrylate as is described in col. 5, ln. 29-50. Such acrylic polymer material is not taught to be electrically conductive, but is taught throughout Shacklette to be optically transmissive and to have other specific optical properties for use as an optical waveguide (*see, e.g.* col. 3, ln. 5-16). It is nowhere suggested that the acrylate polymer is or should be electrically conductive.

Other art referred to but not formally cited in the pending single-reference 35 U.S.C. §102 rejection show conductive polymers formed by polymerization of conductive monomers such as potassium persulphate or azocarboxylic acid in a latex polymer film (*see*, Henry, et. al., U.S. 5,104,580, col. 3, ln 55-63), and electrically conductive particles dispersed in a soft polymeric binder (*see*, Oehmke, U.S. 4,098,945, col. 7, ln. 8-30). Neither reference teaches an acrylate polymer resembling that which is taught in Shacklette, and neither teaches a polymer that would be suitably optically transmissive for use as an optical waveguide as is the acrylate polymer taught in Shacklette.

Shacklette further fails to teach a printed circuit board as is commonly known in the art, but teaches only a substrate upon which an optical waveguide assembly is formed. Such is not taught to comprise any part of an electrical circuit, or to have any features specific to a printed circuit board, which is generally defined as a board having “a circuit for electronic apparatus made by depositing conductive material in continuous paths from terminal to terminal on an insulating surface” (*see*, Webster’s Third New International Dictionary, Unabridged, (1993), definition of “printed circuit” p. 1803).

The present claims, in contrast, recite a printed circuit board (PCB) comprising a dielectric board member, and a first signal line supported on said dielectric board member, said first signal line including an elongated electrically conductive member that is enshrouded with a carbon-based cladding over at least a portion of the elongated conductive member.

Because the cited reference fails to teach the elements of a printed circuit board as is known in the art, fails to teach a first signal line including an elongated electrically conductive member, and consequently fails to teach such a member enshrouded with a carbon-based cladding, the claims of the present invention are believed to be patentably distinct from the cited reference. Reversal of the 35 U.S.C. §102(b) rejection of claims 1-8 is therefore respectfully requested.

COMMUNICATION RE: SUBMISSION OF FORMAL DRAWINGS

Serial Number: 09/732115

Filing Date: December 7, 2000

Title: APPARATUS FOR SHIELDING TRANSMISSION LINE EFFECTS ON A PRINTED CIRCUIT BOARD

Assignee: Intel Corporation

Page 5

Dkt: 884.357US1 (INTEL)

9. Conclusion

Applicant believes the claims are in condition for allowance, and request withdrawal of the rejections to the pending claims. It is respectfully submitted that the cited art fails to anticipate the present invention or to render it obvious, and that the claimed invention is therefore patentably distinct from the cited art. It is respectfully submitted that claims 1-8 should therefore be allowed, and reversal of the Examiner's rejections of pending claims 1-8 is respectfully requested.

Respectfully submitted,

TERRANCE J. DISHONGH ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

P.O. Box 2938

Minneapolis, Minnesota 55402

(612) 349-9581

Date

Sep 2 '03

By



John M. Dahl

Reg. No. 44,639

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Name

Emily Bates

Signature



Appendix A: Pending Claims

1. (Previously Amended) A printed circuit board (PCB) comprising:
a dielectric board member; and
a first signal line supported on said dielectric board member, said first signal line including an elongated electrically conductive member that is enshrouded with a carbon-based cladding over at least a portion of the elongated conductive member.
2. (Previously Amended) The PCB of claim 1, further comprising:
a second signal line supported on said dielectric board member, said second signal line including a second elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion of its length, said second signal line being adjacent to said first signal line.
3. (Original) The PCB of claim 2, wherein:
said carbon-based cladding of said second signal line is continuous with said carbon-based cladding of said first signal line.
4. (Original) The PCB of claim 2, wherein:
said carbon-based cladding of said second signal line is discontinuous with said carbon-based cladding of said first signal line.
5. (Previously Amended) The PCB of claim 1, further comprising:
a second dielectric board member disposed above said dielectric board member and said first signal line.
6. (Original) The PCB of claim 1, wherein:
said elongated conductive member is fully covered over top, bottom and side portions thereof with said carbon-based cladding for said at least a portion of its length.

7. (Original) The PCB of claim 1, wherein:
said elongated conductive member is covered by said carbon-based cladding over greater than 90% of an outer surface thereof.
8. (Original) The PCB of claim 1, wherein:
said carbon based cladding has a dielectric constant that is greater than a dielectric constant associated with said dielectric board member.
9. (Withdrawn) A printed circuit board (PCB) comprising:
a first metallic member that is covered over at least a portion thereof with a carbon-based cladding, said first metallic member to form a first node within an electrical circuit; and
a second metallic member proximate to said first metallic member, said second metallic member to form a second node within the electrical circuit;
wherein a portion of said carbon-based cladding provides a finite electrical resistance between said first metallic member and said second metallic member, said finite electrical resistance to allow an electrical current to flow between said first and second nodes of the electrical circuit during circuit operation.
10. (Withdrawn) The PCB of claim 9 wherein:
said second metallic member physically contacts said carbon-based cladding of said first metallic member.
11. (Withdrawn) The PCB of claim 9 wherein:
said second metallic member is also covered over at least a portion thereof with a carbon-based cladding, wherein said carbon-based cladding of said second metallic member physically contacts said carbon-based cladding of said first metallic member.
12. (Withdrawn) The PCB of claim 9 wherein:

said first metallic member includes an elongated signal line conductor.

13. (Withdrawn) The PCB of claim 9 wherein:

said first metallic member includes metallic plating within a plated through-hole.

14. (Withdrawn) The PCB of claim 9 wherein:

said first and second metallic members each include an elongated signal line conductor.

15. (Withdrawn) A multi-layer printed circuit board (PCB) comprising:

a first dielectric board member having a signal line supported thereon;

a second dielectric board member having a conductive terminal member supported thereon; and

a plated through-hole extending through said first and second dielectric board members, said plated through-hole including a metallic plating covering a carbon-based cladding adhered to an inner surface of said through-hole;

wherein said signal line is conductively coupled to said metallic plating of said plated through-hole through a portion of said carbon-based cladding, said portion of said carbon-based cladding to provide a finite electrical resistance between said signal line and said conductive terminal member within an electrical circuit to be formed using said multi-layer PCB.

16. (Withdrawn) The multi-layer PCB claimed in claim 15, wherein:

said signal line includes an elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion of its length.

17. (Withdrawn) The multi-layer PCB claimed in claim 15, wherein:

said conductive terminal member forms a ground terminal on said second dielectric board member, said finite electrical resistance to act as a pull-down resistance within said electrical circuit.

18. (Withdrawn) The multi-layer PCB claimed in claim 15, wherein:
said conductive terminal member forms a supply terminal on said second dielectric board member, said finite electrical resistance to act as a pull-up resistance within said electrical circuit.
19. (Withdrawn) An electrical subsystem comprising:
a printed circuit board (PCB) including at least one dielectric board member having a plurality of conductive interconnects for providing circuit interconnections within said electrical subsystem, said plurality of conductive interconnects including at least one signal line having an elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion thereof; and
a plurality of external electrical components coupled to said plurality of conductive interconnects of said PCB to form an electrical circuit.
20. (Withdrawn) The electrical subsystem of claim 19, wherein:
said electrical subsystem is a computer processor board and said plurality of electrical components includes at least one digital processing device.
21. (Withdrawn) The electrical subsystem of claim 19, wherein:
said at least one interconnect is adjacent to another interconnect on said at least one dielectric board member, said carbon-based cladding to reduce noise coupling between said at least one interconnect and said another interconnect.
22. (Withdrawn) The electrical subsystem of claim 19, wherein:
said at least one interconnect is covered with said carbon-based cladding over top, bottom, and side portions thereof.
23. (Withdrawn) The electrical subsystem of claim 19, wherein:

a portion of said carbon-based cladding provides a finite electrical resistance between two conductive interconnects of said PCB, said finite electrical resistance to be used as a circuit element within said electrical circuit.

24. (Withdrawn) A method for manufacturing a printed circuit board (PCB) comprising:
providing a dielectric board member;
depositing a carbon-based cladding on an upper surface of said dielectric board member;
adding a metallic layer to an upper surface of said carbon-based cladding;
processing said metallic layer to produce a predetermined metallization pattern on said carbon-based cladding; and
depositing additional carbon-based cladding over at least a portion of said predetermined metallization pattern.

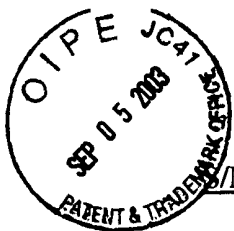
25. (Withdrawn) The method claimed in claim 24, comprising:
removing carbon-based cladding from a region between two signal lines of said predetermined metallization pattern to expose a portion of said upper surface of said dielectric board member.

26. (Withdrawn) The method claimed in claim 24, comprising:
providing a second dielectric board member; and
placing said second dielectric board member over said additional carbon-based cladding.

27. (Withdrawn) The method claimed in claim 24, wherein:
depositing a carbon-based cladding includes applying a carbon black material to said upper surface of said dielectric board member.

28. (Withdrawn) The method claimed in claim 24, wherein:
said dielectric board member includes a glass-reinforced epoxy material.

29. (Withdrawn) The method claimed in claim 24, wherein:
processing said metallic layer includes using photolithography techniques.



EXPEDITED PROCEDURE – EXAMINING GROUP 2827

Serial No. 09/732115

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Terrance J. Dishongh et al. Examiner: Tuan Dinh
Serial No.: 09/732115 Group Art Unit: 2827
Filed: December 7, 2000 Docket No.: 884.357US1
Title: APPARATUS FOR SHIELDING TRANSMISSION LINE EFFECTS ON A PRINTED
CIRCUIT BOARD

APPEAL BRIEF TO THE BOARD OF
PATENT APPEALS AND INTERFERENCES OF THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Mail Stop Appeal Brief - Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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6. Issue Presented for Review

Whether Claims 1-23 are unpatentable under 35 USC § 102(b) in view of Shacklette et. al. (U.S. Patent No. 5,850,498).

7. Grouping of Claims

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Shacklette further fails to teach a printed circuit board as is commonly known in the art, but teaches only a substrate upon which an optical waveguide assembly is formed. Such is not taught to comprise any part of an electrical circuit, or to have any features specific to a printed circuit board, which is generally defined as a board having “a circuit for electronic apparatus made by depositing conductive material in continuous paths from terminal to terminal on an insulating surface” (*see*, Webster’s Third New International Dictionary, Unabridged, (1993), definition of “printed circuit” p. 1803).

The present claims, in contrast, recite a printed circuit board (PCB) comprising a dielectric board member, and a first signal line supported on said dielectric board member, said first signal line including an elongated electrically conductive member that is enshrouded with a carbon-based cladding over at least a portion of the elongated conductive member.

Because the cited reference fails to teach the elements of a printed circuit board as is known in the art, fails to teach a first signal line including an elongated electrically conductive member, and consequently fails to teach such a member enshrouded with a carbon-based cladding, the claims of the present invention are believed to be patentably distinct from the cited reference. Reversal of the 35 U.S.C. §102(b) rejection of claims 1-8 is therefore respectfully requested.

9. Conclusion

Applicant believes the claims are in condition for allowance, and request withdrawal of the rejections to the pending claims. It is respectfully submitted that the cited art fails to anticipate the present invention or to render it obvious, and that the claimed invention is therefore patentably distinct from the cited art. It is respectfully submitted that claims 1-8 should therefore be allowed, and reversal of the Examiner's rejections of pending claims 1-8 is respectfully requested.

Respectfully submitted,

TERRANCE J. DISHONGH ET AL.

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

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Minneapolis, Minnesota 55402

(612) 349-9581

Date

Sep 2 '03

By



John M. Dahl


Reg. No. 44,639

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Name

Emily Bates

Signature



Appendix A: Pending Claims

1. (Previously Amended) A printed circuit board (PCB) comprising:
a dielectric board member; and
a first signal line supported on said dielectric board member, said first signal line including an elongated electrically conductive member that is enshrouded with a carbon-based cladding over at least a portion of the elongated conductive member.
2. (Previously Amended) The PCB of claim 1, further comprising:
a second signal line supported on said dielectric board member, said second signal line including a second elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion of its length, said second signal line being adjacent to said first signal line.
3. (Original) The PCB of claim 2, wherein:
said carbon-based cladding of said second signal line is continuous with said carbon-based cladding of said first signal line.
4. (Original) The PCB of claim 2, wherein:
said carbon-based cladding of said second signal line is discontinuous with said carbon-based cladding of said first signal line.
5. (Previously Amended) The PCB of claim 1, further comprising:
a second dielectric board member disposed above said dielectric board member and said first signal line.
6. (Original) The PCB of claim 1, wherein:
said elongated conductive member is fully covered over top, bottom and side portions thereof with said carbon-based cladding for said at least a portion of its length.

7. (Original) The PCB of claim 1, wherein:
said elongated conductive member is covered by said carbon-based cladding over greater than 90% of an outer surface thereof.
8. (Original) The PCB of claim 1, wherein:
said carbon based cladding has a dielectric constant that is greater than a dielectric constant associated with said dielectric board member.
9. (Withdrawn) A printed circuit board (PCB) comprising:
a first metallic member that is covered over at least a portion thereof with a carbon-based cladding, said first metallic member to form a first node within an electrical circuit; and
a second metallic member proximate to said first metallic member, said second metallic member to form a second node within the electrical circuit;
wherein a portion of said carbon-based cladding provides a finite electrical resistance between said first metallic member and said second metallic member, said finite electrical resistance to allow an electrical current to flow between said first and second nodes of the electrical circuit during circuit operation.
10. (Withdrawn) The PCB of claim 9 wherein:
said second metallic member physically contacts said carbon-based cladding of said first metallic member.
11. (Withdrawn) The PCB of claim 9 wherein:
said second metallic member is also covered over at least a portion thereof with a carbon-based cladding, wherein said carbon-based cladding of said second metallic member physically contacts said carbon-based cladding of said first metallic member.
12. (Withdrawn) The PCB of claim 9 wherein:

said first metallic member includes an elongated signal line conductor.

13. (Withdrawn) The PCB of claim 9 wherein:

said first metallic member includes metallic plating within a plated through-hole.

14. (Withdrawn) The PCB of claim 9 wherein:

said first and second metallic members each include an elongated signal line conductor.

15. (Withdrawn) A multi-layer printed circuit board (PCB) comprising:

a first dielectric board member having a signal line supported thereon;

a second dielectric board member having a conductive terminal member supported

thereon; and

a plated through-hole extending through said first and second dielectric board members, said plated through-hole including a metallic plating covering a carbon-based cladding adhered to an inner surface of said through-hole;

wherein said signal line is conductively coupled to said metallic plating of said plated through-hole through a portion of said carbon-based cladding, said portion of said carbon-based cladding to provide a finite electrical resistance between said signal line and said conductive terminal member within an electrical circuit to be formed using said multi-layer PCB.

16. (Withdrawn) The multi-layer PCB claimed in claim 15, wherein:

said signal line includes an elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion of its length.

17. (Withdrawn) The multi-layer PCB claimed in claim 15, wherein:

said conductive terminal member forms a ground terminal on said second dielectric board member, said finite electrical resistance to act as a pull-down resistance within said electrical circuit.

-
18. (Withdrawn) The multi-layer PCB claimed in claim 15, wherein:
- said conductive terminal member forms a supply terminal on said second dielectric board member, said finite electrical resistance to act as a pull-up resistance within said electrical circuit.
19. (Withdrawn) An electrical subsystem comprising:
- a printed circuit board (PCB) including at least one dielectric board member having a plurality of conductive interconnects for providing circuit interconnections within said electrical subsystem, said plurality of conductive interconnects including at least one signal line having an elongated conductive member that is enshrouded with a carbon-based cladding over at least a portion thereof; and
- a plurality of external electrical components coupled to said plurality of conductive interconnects of said PCB to form an electrical circuit.
20. (Withdrawn) The electrical subsystem of claim 19, wherein:
- said electrical subsystem is a computer processor board and said plurality of electrical components includes at least one digital processing device.
21. (Withdrawn) The electrical subsystem of claim 19, wherein:
- said at least one interconnect is adjacent to another interconnect on said at least one dielectric board member, said carbon-based cladding to reduce noise coupling between said at least one interconnect and said another interconnect.
22. (Withdrawn) The electrical subsystem of claim 19, wherein:
- said at least one interconnect is covered with said carbon-based cladding over top, bottom, and side portions thereof.
23. (Withdrawn) The electrical subsystem of claim 19, wherein:

a portion of said carbon-based cladding provides a finite electrical resistance between two conductive interconnects of said PCB, said finite electrical resistance to be used as a circuit element within said electrical circuit.

24. (Withdrawn) A method for manufacturing a printed circuit board (PCB) comprising:
providing a dielectric board member;
depositing a carbon-based cladding on an upper surface of said dielectric board member;
adding a metallic layer to an upper surface of said carbon-based cladding;
processing said metallic layer to produce a predetermined metallization pattern on said carbon-based cladding; and
depositing additional carbon-based cladding over at least a portion of said predetermined metallization pattern.
25. (Withdrawn) The method claimed in claim 24, comprising:
removing carbon-based cladding from a region between two signal lines of said predetermined metallization pattern to expose a portion of said upper surface of said dielectric board member.
26. (Withdrawn) The method claimed in claim 24, comprising:
providing a second dielectric board member; and
placing said second dielectric board member over said additional carbon-based cladding.
27. (Withdrawn) The method claimed in claim 24, wherein:
depositing a carbon-based cladding includes applying a carbon black material to said upper surface of said dielectric board member.
28. (Withdrawn) The method claimed in claim 24, wherein:
said dielectric board member includes a glass-reinforced epoxy material.

29. (Withdrawn) The method claimed in claim 24, wherein:
processing said metallic layer includes using photolithography techniques.